

REMARKS

I. INTRODUCTION

Claims 1-65 are presently pending.

Applicants respectfully requests reconsideration of the present application in view of the reasons that follow.

II. THE OFFICE ACTION

Rejections based on 35 U.S.C. § 112, first paragraph should be withdrawn

Claims 1-65 were rejected under 35 U.S.C. § 112, first paragraph as allegedly lacking enablement. Applicants respectfully traverse the rejection.

While, the Patent Office mentions *In re Wands*, 858 F.2d 731 (Fed. Cir. 1988) in the Office Action, it appears that it has failed to apply the facts of this case to the law articulated in many of the factors in *Wands*. More specifically, the Patent Office has failed to consider the numerous working examples disclosed in the Application. Applicants contend that the working examples, in addition to the relative skill of those in the art, provide sufficient evidence to establish enablement for at least the reasons that follow.

The court in *Wands* relied on the factors set forth in *In re Forman*, 230 USPQ 546, 547 (Bd.Pat.App. & Int. 1986) which address what constitutes “undue experimentation.” *Id.* at 737. *Forman* recites factors to be considered in determining whether the practice of a claimed invention would require undue experimentation. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *Id.* at 737.

1. Quantity of Experimentation Necessary

The instant disclosure provides guidance on how to prepare at least five different types of dendritic macromolecules: (i) alkoxyated pentaerythritol/2,2-dimethylolpropionic acid dendritic macromolecules with varying OH-functionality as described in, e.g., Examples

A-D¹; (ii) 9-carbon-aliphatic-acid-capped dendritic macromolecules with varying OH-functionality, as described in, e.g., Examples E and F²; (iii) trimethylolpropane oxetane-derived dendritic macromolecules with varying OH-functionality, as described in Examp^l G³; (iv) amine-terminated dendritic polymers of polyether type, as described in, e.g., Example K⁴; and (v) amine-terminated dendritic polymers of polyester type, as described in, e.g., Example L⁵. In addition, the present specification provides guidance on how to prepare a large variety of at least 21 different isocyanate-based foams with varying physical properties (e.g., foam hardness and load efficiency), as described in Examples M-Q⁶ and Examples 1-16.

As in *Wands*, a high level of skill existed at the time of filing with the methods needed to practice the invention. Knowledge of synthetic organic and foam production chemistry was well known at the time of filing. In their disclosure, Applicants have provided evidence that the level of skill in preparing the various dendritic macromolecules and the various isocyanate-based foams with varying physical properties according to the pending claims was highly developed as of the filing date of the application. Thus, contrary to the Patent Office's assertions on page 2 of the Office Action, applicants have provided sufficient evidence to enable one of ordinary skill in the art to practice the claimed invention without undue experimentation.

2. Amount of direction and guidance in the specification

In the instant application, the inventors have provided disclosure of how to prepare the dendritic macromolecules according to the Examples enumerated above and how to use them to make isocyanate-based foams. Thus, the inventors not only teach how to make dendritic

¹ Examples B-D were filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0097]-[0105].

² Examples E and F were filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0106]-[0111].

³ Examples G was filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0112]-[0113].

⁴ Example K was filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0124]-[0128].

⁵ Examples L was filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0129]-[0131].

⁶ Examples M-Q were filed with the Request for Continued Examination of June 14, 2005 as paragraphs [0132]-[0142].

macromolecules, but they also teach how to use them to make isocyanate-based foams. The skilled artisan would therefore know how to manipulate the disclosed dendritic macromolecules and a myriad of other dendritic macromolecules that are a logical extension of the disclosed dendritic macromolecules⁷, to make the isocyanate-based foams encompassed by the pending claims, based on the teachings in the specification.

3. *Presence or absence of working examples*

The presence of working examples is the third prong set forth in *Forman*. As noted above, the present specification provides a large number of examples of how to make and use the presently claimed invention.

4. *Nature of the invention*

The nature of the present invention relates to the synthesis of dendritic macromolecules and their use in making isocyanate-based foams. The dendritic macromolecules and the isocyanate-based foams of the invention can be prepared using classic techniques found in organic chemistry and prepared by the synthetic protocols thoroughly described in the instant disclosure. Further, a myriad of other dendritic macromolecules that are a logical extension of the disclosed dendritic macromolecules disclosed and isocyanate-based foams comprising such dendritic macromolecules can be made using the teachings of the instant disclosure.

5. *State of the prior art*

The state of the prior art at the time the invention was made was such that it is known how to make isocyanate-based foams and it was known how to make dendritic macromolecules, but it was not known how to make isocyanate-based foams comprising dendritic macromolecules as claimed—not even in the art on which the Patent Office has relied to make its obviousness rejection, *viz.*, U.S. Patent Nos. 6,316,514 and 6,114,458.

6. *Relative skill of those in the art*

The relative skill in the art relates to routine practices of the skilled worker. In the present field, the skilled worker would have to be able to synthesize the dendritic

⁷ That is, dendritic macromolecules other than those disclosed in U.S. Prov. Appl. Ser. No. 60/221,512

macromolecules and make the isocyanate-based foams with the novel properties recited in the pending claims by following the teachings of the instant disclosure.

7. *The predictability or unpredictability of the art*

The level of predictability in the art is another factor to consider. In this case, there is a high level of predictability in the art. But, even if there were unpredictability in the art, *e.g.*, how to make isocyanate-based foams according to the pending claims, one skilled in the art would soundly rely on teachings in the specification to address that unpredictability.

8. *Breadth of the claims*

The seventh factor is the breadth of the claims. While the pending claims are admittedly broad, they are not so broad as to lack enablement. The Patent Office asserts that “Applicants’ additionally defined components in their claims do not serve to define the dendritic macromolecules of applicants’ claims but rather behaviors of the combinations of components or behaviors when the macromolecules are not present.” *Office Action* at page 3. The Patent Office concludes that “[u]due experimentation would be required in determining what combinations of polyether polyols and dendritic macromolecules and/or other materials would be included or excluded by the claims.” *Id.* Applicants respectfully submit that the Patent Office seems to be conflating the issue of enablement over the entire scope of the claims with the issue of public notice as to the patentee’s scope of protection when the patent issues. Insofar as this rejection pertains to enablement, Applicants respectfully submit that the entire scope of the pending claims is enabled at least because (i) Applicants have provided a significant amount of guidance in the instant disclosure by way of a large number of examples; and (ii) the relative skill of those in the art is high.

Applicants have demonstrated that the Patent Office has failed to apply the facts of this case to the law articulated in *Wands*. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

which is incorporated by reference into the instant application, in its entirety.

Rejections based on 35 U.S.C. § 103(a) should be withdrawn

Claims 1-65 were rejected as being unpatentable over U.S. Patent No. 6,315,514 to Falke, *et al.* (“Falke”) in view of U.S. Patent No. 6,114,458 to Hawker, *et al.* (“Hawker”) for the reasons discussed on pages 3-6 of the Office Action. Applicants respectfully traverse this art rejection.

It is well settled that the Patent Office bears the burden of establishing a *prima facie* case of obviousness under 35 U.S.C. § 103. *In re Deuel*, 51 F.3d 1552, 1557 (Fed. Cir. 1995); *In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, the Patent Office must first show that the prior art suggested to those of ordinary skill in the art that they should make the claimed device or composition. Second, it must show that the prior art would have provided one of ordinary skill in the art with a reasonable expectation of success. Both the suggestion and the reasonable expectation of success must be adequately founded in the prior art and not in an applicant’s disclosure. Third, the Patent Office must show that the prior art teaches or suggests all the claim limitations. *Manual of Patent Examination and Procedure* (MPEP) § 2143; *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

These criteria must be satisfied with factual and objective evidence found in the prior art: an examiner’s conclusory statement cannot form a basis for a *prima facie* case of obviousness. *In re Sang-Su Lee*, 277 F.3d 1338, 1343-4 (Fed. Cir. 2002). Thus, when conducting an analysis under 35 U.S.C. § 103(a), an Examiner “must step backward in time and into the shoes worn by the hypothetical ‘person of ordinary skill in the art’ when the invention was unknown and just before it was made.” MPEP §2142. This is important, as “impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.” *Id.* Consequently, when determining whether or not a claimed invention is obvious, one must cast his/her “mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then accepted wisdom in the field.” *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999).

Applicants respectfully assert that the Patent Office has not met its burden for establishing a *prima facie* case of obviousness of the claims over Falke in view of Hawker for

at least the reasons that follow. First, the Patent Office has not shown that Falke suggested to those of ordinary skill in the art that they should make a foamed isocyanate-based polymer where the polymer comprises a dendritic macromolecule as claimed in claims 1, 3-5 and 7-65. The Patent Office, in fact, admits that Falke's foams do not comprise any dendritic macromolecules in the paragraph bridging pages 3 and 4 of the Office Action. Further, Falke does not suggest to those skilled in the art that they should make a foamed isocyanate-based polymer comprising a cellular matrix comprising a plurality of interconnected struts as claimed in claims 2 and 6. Finally, Falke does not suggest to those skilled in the art that they should make, for example, a foamed isocyanate-based polymer wherein the active hydrogen-containing compound confers to the cellular matrix a load efficiency in the range of from about 15 to about 50 Newtons/weight % active hydrogen-containing compound as claimed in claim 3. Instead, Falke teaches polyurethane (PUR) foams that comprise only polyetherol mixtures where the polyetherols are based on propylene oxide and/or butylene oxide and/or ethylene oxide. Col. 2, lines 25-48. Applicants posit that such polyetherols can not be considered dendritic macromolecules. Applicants respectfully offer that none of Falke's PUR foams have the physical properties of the claimed foamed isocyanate-based polymers. And, the Patent Office has not provided any evidence to the contrary.

The Patent Office is of the opinion that "Hawker discloses the employment of the dendritic macromolecules of applicants' claims in urethane foam synthesis for the purpose of imparting their viscosity modifying effect." *Office Action* at page 4. The Patent Office is further of the opinion that:

it would have been obvious for one of ordinary skill in the art to have utilized the dendritic macromolecules of Hawker et al. in the polyurethane foam preparations of Falke et al. for the desired effect of imparting viscosity modification to the reactive mixtures in order to arrive at the compositions and processes of applicants' claims with the expectation of success in the absence of a showing of new or unexpected results.

Id.

But, aside from these conclusory statements, the Patent Office has not presented any evidence gleaned from Falke, Hawker and/or from the knowledge of those skilled in the art, that those skilled in the art would be motivated to use the dendritic macromolecules of Hawker to make the polyurethane foams of Falke. Hawker, in fact, would seem to teach

away from the use of dendritic macromolecules to make foams, since Hawker suggests using the dendritic macromolecules he discloses as a toughener for thermoset resins—materials that are much different from foams. *See*, Col. 7, lines 55-67. In short, the Patent Office has not provided the requisite evidence showing that Falke, in view of Hawker, suggested to one of ordinary skill in the art that they should make the claimed composition.

Second, the Patent Office has failed to point to any evidence found in Falke and/or in Hawker that would have provided one of ordinary skill in the art with a reasonable expectation of success in making the claimed invention. The Patent Office has only provided a conclusory statement on page 4 of the Office Action that the skilled artisan would expect to succeed in making the claimed invention if they used the dendritic macromolecules of Hawker to make the foams of Falke.

Third, the Patent Office has failed to show that Falke, in view of Hawker, teaches or suggests all the claim limitations. Neither Falke nor Hawker, for example, teach or suggest a foamed isocyanate-based polymer comprising a cellular matrix comprising a plurality of interconnected struts as claimed in claims 2 and 6. Also, Neither Falke nor Hawker teach or suggest a foamed isocyanate-based polymer wherein the active hydrogen-containing compound confers to the cellular matrix a load efficiency in the range of from about 15 to about 50 Newtons/weight % active hydrogen-containing compound as claimed in claim 3. Accordingly, Falke, in view of Hawker, does not teach or suggest all of the claim limitations.

Applicants respectfully assert that the Patent Office has engaged in impermissible hindsight in attempting to establish a *prima facie* case of obviousness against the claimed invention when attempts to combine the teachings of Falke and Hawker to arrive at the claimed invention. As noted above, “impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art” not from Applicants’ disclosure. *MPEP* §2142. Further, the conclusory statements that the Examiner has provided to establish that those skilled in the art would be motivated to use the dendritic macromolecules of Hawker to make the polyurethane foams of Falke cannot form a basis for a *prima facie* case of obviousness. *In re Sang-Su Lee*, 277 F.3d at 1343-4. Similarly, the conclusory statements the Examiner has provided to establish that the skilled artisan would expect to succeed in making the claimed invention if they used the dendritic macromolecules

of Hawker to make the foams of Falke cannot form a basis for a *prima facie* case of obviousness.

Applicants respectfully assert that, for at least the foregoing reasons, the Patent Office has failed to establish a *prima facie* case of obviousness. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

III. CONCLUSION

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-1710. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-1710. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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